**Amendments to the Specification:**

Please replace the paragraph beginning at p. 11, line 18, with the following rewritten paragraph:

However, according to both the techniques, in the GaN film grown on the (0001) plane of the $ZrB_2$ single crystal substrate, a rocking curve ~~half value width~~ FWHM (TILT) of (0002) plane omega scan by an X-ray diffraction method, which becomes an indicator of evaluation of quality, is approximately 1000 ~~seconds~~ arcseconds, which is not sufficiently good (refer to "Study on the crystal growth and properties of group-III nitride semiconductors on $ZrB_2$ substrate by metalorganic vapor phase epitaxy" master's thesis written by Yohei Yukawa, graduate school of Meijo University, 2001).

Please replace the paragraph beginning at p. 21, line 23, with the following rewritten paragraph:

As described above, according to the invention, in the case of growing a nitride semiconductor layer which contains at least one selected from among B, Al, Ga, In and Ti on the (0001) plane of the diboride single crystal substrate expressed by a chemical formula $XB_2$, in which X contains at least one of Ti, Zr, Nb and Hf, by the MOVPE method, by growing the $(AlN)_x(GaN)_{1-x}$ layer ($0 < x \leqq 1$) between the diboride single crystal substrate and the nitride semiconductor layer at 400 °C to 1100 °C, and preferably, growing to film thickness of 10 nm to 100 nm, crystalline quality of the nitride semiconductor is increased as apparent from that a rocking curve ~~half value width~~ FWHM (TILT) of (0002) plane omega scan by an X-ray diffraction method is a value smaller than 1000 ~~seconds~~ arcseconds. Therefore, according to the invention, a characteristic and the yield of a device such as a light emitting diode produced on the $ZrB_2$ single crystal substrate are increased.

Please replace the text at p. 27, line 17-p. 28, line 16, with the following rewritten text:

Fig. 5 is a view showing a surface ~~state~~ morphology B of GaN film;

Fig. 6 is a view showing a surface ~~state~~ morphology A of GaN film;

Fig. 7 is a graph showing a relation between an angle formed by a normal line of a principal surface of the substrate and a normal line of the (0001) plane and a surface ~~state~~ morphology;

Fig. 8 is a schematically sectional view of the semiconductor apparatus in which a nitride semiconductor layer is formed on a $ZrB_2$ single crystal substrate;

Fig. 9 is a view showing of photographs of surfaces of GaN films;

Fig. 10 is a line view showing a relation between film thickness of $(AlN)_x(GaN)_{1-x}$ and X-ray ~~half value width~~ FWHM (TILT);

Fig. 11 is a schematically sectional view of the semiconductor apparatus in which a nitride semiconductor layer is formed on a $ZrB_2$ single crystal substrate;

Fig. 12 is a line view showing a relation between an off angle of a substrate surface and surface ~~state~~ morphology;

Fig. 13 is a view showing a surface ~~state~~ morphology (surface ~~state~~ morphology B) of GaN film;

Fig. 14 is a view showing a surface ~~state~~ morphology (surface ~~state~~ morphology A) of GaN film according to the invention;

Please replace the paragraph beginning at p. 31, line 14, with the following rewritten paragraph:

For forming semiconductor buffer layer in crystal growth, a molecular beam epitaxy (MBE) method, a metalorganic vapor phase epitaxy (MOCVD) method, a hydride vapor epitaxy (HVPE) method, a sublimation method and the like are used. Moreover, it is possible to appropriately combine the aforementioned growing methods as well. For example, it is possible to use the MBE method, by which it is possible to grow while controlling a surface ~~state~~ morphology, for initial epitaxy growth, and use the HVPE method, by which it is possible to grow at high speeds, for a thick GaN thin film required.

Please replace the text at p. 37, line 22-p. 38, line 22, with the following rewritten text:

In microscopic observation of surfaces of the GaN films 12 after growth, surfaces with much unevenness as shown in Fig. 5 (surface ~~state~~ morphology B) and surfaces of smooth states as shown in Fig. 6 (surface ~~state~~ morphology A) were observed, respectively.

A relation between the off angles of the $ZrB_2$ single crystal substrates 10 and the surface morphologys of the grown films is shown in Fig. 7. Here, an angle $\theta 2$ of deviation from a [0001] crystal axis 32 of the normal line 33 of the surface 34 of the substrate 10 in the [10-10] direction, an angle $\theta 3$ of deviation of the same in the [11-20] direction, and the sum of squares of these deviation angles (= $\theta 2^2 + \theta 3^2$) are shown by the lines 36, 37 and 38, respectively. All substrates that the sums of squares of the deviation angles were less than 0.7° kept good surface morphologys of the surface ~~state~~ morphology A.

Regarding substrates that the sums of squares of the deviation angles were 0.7° or more and less than 1.7°, both the surface ~~state~~ morphology A and the surface ~~state~~ morphology B were observed. It can be concluded that this results from variation of operations in the growth experiment and states of the device, and it is believed that the surface ~~state~~ morphology A can be reproduced by reducing the variation. In the case of substrates that the sums of squares of the deviation angles were 1.7° or more, almost all of the substrates kept the surface ~~state~~ morphology B.

Please replace the paragraph beginning at p. 43, line 2, with the following rewritten paragraph:

Further, a value of x, and a rocking curve ~~half value width~~ FWHM (TILT) of (0002) plane omega scan by an X-ray diffraction method are shown on the right of description of the temperature given in each of the Fig. 9 (refer to Table 2).

Please replace Table 2 on p. 44 with the following rewritten table:

[Table 2]

| Fig.9 | Working example /Comparative example | Deposition temperature T (°C) | x | ~~Half value width (seconds)~~ FWHM (TILT) (arcseconds) |
|---|---|---|---|---|
| (1) | Comparative example 1 | 400 or less | 0.8 | - |
| (2) | Working example 1 | 725 | 0.6 | 760 |
| (3) | Working example 2 | 850 | 0.5 | 596 |
| (4) | Working example 3 | 925 | 0.4 | - |
| (5) | Comparative example 2 | 1100 or more | 0.25 | 873 |

Please replace the 3 paragraphs beginning directly after Table 2 on p. 44 to p. 45, line 16, with the following rewritten text:

As apparent from these results, the GaN film was not formed at 400 °C or less, and the GaN film had a hexagonal surface shape at 1100 °C or more. The GaN films had smooth surfaces at 850 °and 725 °C. Here, the rocking curve ~~half value width~~ FWHM (TILT) was 1000 ~~seconds~~ arcseconds or less in every case that the growth temperature T was more than 400 °C and less than 1100 °C.

A relation between film thickness of the $(AlN)_x(GaN)_{1-x}$ layer deposited at 850 °C and the rocking curve ~~half value width~~ FWHM (TILT) of the (0002) plane omega scan by the X-ray diffraction method is shown in Fig. 10. In a case where the layer was grown in a setting such that the film thickness was less than 10 nm, a surface ~~state~~ morphology thereof became the same as that at deposition temperatures 400 °C or less. It can be read from the graph that the ~~half value width~~ FWHM (TILT) becomes 1000 ~~seconds~~ arcseconds or less between the film thickness 10 nm and 100 nm.

Further, for comparison, in a comparative example 3, after the AlN layer was deposited on the $ZrB_2$ substrate at 600 °C, GaN was grown to approximately 3 μm at 1150 °C. Source gases used at the time of growing the AlN layer were $NH_3$ and TMA. The amounts of supplied TMA and $NH_3$ as the sources were 3.5 μmol/min and 0.07 mol/min, respectively, and 2slm of $H_2$ was flown as a carrier gas. Conditions other than the above were the same as those of the $(AlN)_x(GaN)_{1-x}$ layer. The rocking curve ~~half value width~~ FWHM (TILT) of the (0002) plane omega scan by X-ray diffraction was approximately 1000 ~~seconds~~ arcseconds.

Please replace the text at p. 48, line 10-p. 49, line 8, with the following rewritten text:

In observation of surfaces of the GaN films 216 after growth, an uneven surface as shown in Fig. 13 (surface ~~state~~ morphology B) and a smooth surface as shown in Fig. 14 (surface ~~state~~ morphology A) are observed.

Then, a relation between an off angle $\theta 1$ of the $ZrB_2$ single crystal substrate 218 and a surface ~~state~~ morphology of the grown film is shown in Fig. 12. Here, an angle $\theta 4$ of deviation of a normal line 33 (refer to aforementioned Fig. 12) on a surface of a substrate 218 from a [0001] crystal axis 32 in the [10-10] direction, an angle $\theta 5$ of deviation of the same in the [11-20] direction, and the sum of squares ($= \theta 4^2 + \theta 5^2$) thereof are shown by lines 236, 237 and 238 in Fig. 12, respectively. All substrates that the sums of squares of the off angle are 0.35 degrees or less keep the surface ~~state~~ morphology A. In the case of substrates that the sum of squares of the off angles are between 0.35 degrees and 0.55 degrees, both the surface ~~state~~ morphology A and the surface ~~state~~ morphology B are observed. It can be concluded that this results from variation of operations in the growth experiment and states of the device, and it is believed that the surface ~~state~~ morphology A can be reproduced by reducing the variation. All substrates that the sums of squares of the off angles are 0.55 degrees or more keep the surface ~~state~~ morphology B.

Please replace the paragraph beginning at p. 51, line 3, with the following rewritten paragraph:

Further, these growth methods may be used in combination. For example, it is possible to use the MBE method or the MOCVD method, by which it is possible to grow while controlling a surface ~~state~~ morphology, for initial epitaxy growth, and use the HVPE method, by which it is possible to grow at high speeds, for a thick GaN thin film 311 required.